REMARKS

At the time of the last Office Action Final Rejection and prior to filing the Request for Continued Examination (RCE) which has been filed concurrently herewith, claims 1-6, 8, 10, 11, 15-18 and 20-25 were present as elected claims in the application. Of those elected claims, claims 1 and 15 were independent claims. Claims 12-14 which were also in the application are non-elected pursuant to an earlier restriction requirement and were withdrawn from consideration.

In the last Office Action, all of the elected claims were finally rejected as follows:

1. Claims 1, 2, 4, 15, 16, 18, 21 and 23-25 were rejected as obvious under 35 U.S.C. §103(a) over NAYDOWSKI et al. (5,605,568) in view of SCHIAPPA et al (4,729,928);

2. Claim 5 was rejected as obvious under 35 U.S.C. §103(a) over NAYDOWSKI et al in view of SCHIAPPA et al, and further in view of GOVERS et al (6,482,581);

3. Claims 6, 8, 11, 20 and 22 were rejected as obvious under 35 U.S.C. §103(a) over NAYDOWSKI et al in view of

SCHIAPPA et al, and further in view of VIRATANEN (6,143,064);

4. Claims 1-3, 8, 10, 15-17, 21 and 23-25 were rejected as obvious under 35 U.S.C. §103(a) over HIORNS et al (6,284,034) in view of SCHIAPPA et al;

5. Claim 5 was rejected as obvious under 35 U.S.C. §103(a) over HIORNS et al in view of SCHIAPPA et al and GOVERS et al;

6. Claims 6, 8, 11, 20 and 22 were rejected as obvious under 35 U.S.C. §103(a) over HIORNS et al in view of SCHIAPPA et al and further in view of VIRATANEN;

7. Claims 1, 2, 4, 11, 15, 16, 18, 21 and 23-25 were rejected as obvious under 35 U.S.C. §103(a) over STRAUCH et al. (4,279,661) in view of SCHIAPPA et al;

8. Claim 5 was rejected as obvious under 35 U.S.C. §103(a) over STRAUCH et al in view of SCHIAPPA et al, and further in view of GOVERS et al;

9. Claims 6, 8, 11, 20 and 22 were rejected as obvious under 35 U.S.C. §103(a) over STRAUCH et al in view of SCHIAPPA et al, and further in view of VIRATANEN; and

10. Claims 3, 10 and 17 were rejected as obvious under 35 U.S.C. §103(a) over STRAUCH et al in view of SCHIAPPA et al, and further in view of FERRIS (3,661,610).

In the present invention a support material is provided as a support for a photographic, ink jet or thermal transfer image receptive layer thereon. In the support material of the invention a pigment coating is applied onto a paper or other base support, and a polyolefin coating is applied to the pigment coating. The image receptive layer upon on which the image is to be ultimately applied is positioned on the polyolefin coating.

In the present invention the pigment coating applied onto the paper base support is particularly selected to be of a specific particle size distribution. This particle size distribution allows a thinner synthetic polyolefin coating because it presents a very smooth surface. However, those skilled in the art would have expected that such very smooth surface to which the polyolefin is to be applied would result in a decrease in the adherence of the

polyolefin resin. However and in spite of the lower roughness of the pigment coating in the invention, the inventors have surprisingly discovered that the underlying pigment coating provides excellent adherence to the polyolefin resin applied on the pigment coating. See specification, page 4. Moreover, because of the very smooth surface due to the claimed grain size distribution applicants have discovered it is possible to apply the synthetic resin by extrusion much faster and with much fewer defects in the polyolefin resin layer than on non-coated supports. Also, applicants have discovered that the support material of the invention and as set forth in the claims allows a reduction in the amount of the polyolefin synthetic resin which is typically a polyolefin.

NAYDOWSKI et al. discloses a $CaCO_3$ and talc coating pigment slurry which is coated on paper to provide good printability **on the pigment coating** (col. 3, 1.31-46, col. 8, 1.41-53). NAYDOWSKI et al. discloses an average statistical particle diameter of 0.4 to 1.5 μm for the pigment coating. **This calcium carbonate and talc pigment coating is then directly printed upon by gravure printing and there is no disclosure of a polyolefin or any other coating on the pigment layer.**

HIORNS et al. discloses a pigment material for use in the coating of paper and, in particular, papers to be used in an electrophotographic printer (col. 1, 1.8-18). The pigment composition is formed by two components having different particle size distributions. Component A has a D50 value from 0.4 to 0.7 μm. This means 50% of the particles have an average diameter between 0.4 and 0.7 μm. The particle size range of the particles of component B is 2 to 10 μm. Component B has a larger particle size distribution and larger particle sizes than the pigment set forth in the claims of the present application. As in NAYDOWSKI et al, **the electrophotographic printing is on the pigment layer and there is no disclosure or suggestion of a polyolefin or any other coating on the pigment coating.**

STRAUCH et al. discloses a mineral filler, such as calcium carbonate, which contains at most 15% by weight of particles which are smaller than 0.2 μm, and 80 to 95% of the particles are preferably smaller than 1 μm. The filler is for use in glossy paper coating compositions, such as papers which are to be printed upon. As in NAYDOWSKI et al. and HIORNS et al., **the printing is on the pigment and there is no disclosure or suggestion of a polyolefin or any other coating on the pigment.**

VIRATANEN is directed to a pigment particle product and its use as filler and coating pigments in paper manufacture for printing papers. The calcium carbonate of VIRATANEN comprises from 30 to 90% by weight of particles of precipitated calcium carbonate in the size range from 30 nm to 100 nm. **Again any printing that might be on the VIRATANEN paper will be on the pigments and no polyolefin or other coating on the pigment is disclosed or suggested by VIRATANEN contrary to the present invention.**

The Examiner has taken the position that the last mentioned prior art and primary references which have relied upon in the rejection of the claims therefore teach pigment coatings on paper which have the pigment grain size distribution as set forth in applicants' claims. Applicants disagree with this conclusion and respectfully submit that the grain sizes disclosed in the aforementioned prior art do not meet the grain size distrubutions as claimed for the reasons previously discussed at length in applicants' earlier replies, for example in the reply mailed December 30, 2003, which applicants incorporate herein by reference.

As to the application of a polyolefin or for that matter any other polymer coating on the pigment coating as in the present

claimed invention, the Examiner admits that the aforementioned prior art does not disclose or suggest such polymer coating on a pigment coating. However, the Examiner has relied upon SCHIAPPA et al. as a secondary reference in an attempt to cure this critical defficiency of the primary references, i.e. the absence of a polyolefin coating on a pigment coating on paper.

The SCHIAPPA et al. invention is directed to a durable high gloss water-based protective coating composition which contains a mixture of ethylene acrylic acid (EAA) and N-methyl-pyrrolidone (NMP). This protective coating mixture is considered by SCHIAPPA et al. to be a replacement for nitrocellulose and related coatings which provide gloss and protection of the previously printed images on for example commonly conventional clay-coated papers. However, SCHIAPPA et al. is silent as to the particle size distribution of the clay which is coated on the raw paper.

Accordingly, the claims of the present application clearly define over the SCHIAPPA et al. invention due both to the claimed pigment particle size distributions of the present invention and because of the claimed polyolefin resin which is clearly not the

EAA and NMP gloss providing polymer mixture of SCHIAPPA et al. invention.

However, at column 5, lines 34 to 42, SCHIAPPA et al. states that its resin mixture is much superior in gloss as compared to previous polyolefin laminated coatings which were previously applied as protective coatings over printing. It is this teaching of earlier prior art polyolefin coatings on printing within the SCHIAPPA prior art which the Examiner has relied upon to support the position which he has taken that it would have been obvious to place a polyolefin protective coating on the printed pigment coatings of the primary references.

The Examiner has also recognized that none of the above described prior art, i.e. neither the previously discussed prior art nor SCHIAPPA et al., either alone or when combined, is directed to a support material for photographic, ink jet or thermal transfer image receptive layers as in the present invention, and in which such images are to be developed on the polyolefin coating and not on the pigment coating. In contrast, all of the cited prior art is directed to the printing of the image on a pigment coating, and the purpose of the pigment particle sizing in the primary reference prior art is to obtain a good image thereon typically by gravure

printing. In contrast, the purpose of the pigment coating and its grain size distribution in the present invention has nothing to do with an image on the pigment coating because the image is not on the pigment coating. It is on the later applied image receptive layer on the polyolefin coating. The purpose of the grain size distribution in the claimed invention is to achieve thinner synthetic polyolefin coatings which have a very smooth surface thereby reducing the amount of polyolefin needed and also permitting much higher extrusion speeds and with fewer defects than in the prior non-pigment coated supports.

However, recognizing these distinct differences in purpose between the present invention and SCHIAPPA et al, the Examiner has taken the position that it would have been obvious to apply the polyolefin coating to the preprinted pigment coatings of the primary reference prior art simply for the purpose of protection of image as discussed in SCHIAPPA et al.

Even if it is conceded that SCHIAPPA et al suggests that in the past a polyolefin protective coating was applied on a preprinted pigment layer for protection, one skilled in the art would not consider the application of the polyolefin coating on pigment coatings of the grain size distributions set forth in the

primary references (if those primary reference grain size distrubutions do in fact meet the grain size distributions as claimed and as must be contended by the Examiner to be able to reject the claims). That is because as set forth in the present application, it was **surprising** that the polyolefin layer when applied to the substantially smoother pigment layer of the claimed grain size distribution (and thus the primary reference grain size distributions) results in better adhesion between the two layers. One skilled in the art would have expected the opposite, i.e. poor adhesion. Accordingly, one skilled in the art would have been dissuaded from applying a polyolefin protective layer to the pigment layers of the primary references because of the expected poor adhesion between the polyolefin and such pigment grain size distributions of the primary reference pigment layers.

Conversely, if the grain size distributions of the pigments of the primary reference prior art are not those of the claimed invention so that those skilled in the art would not be dissuaded from applying a polyolefin protective coating, then none of the prior art of record even when combined discloses or suggests the grain size distribution of the claimed invention and, therefore, the rejection must be withdrawn.

Indeed, it must also be noted that SCHIAPPA et al is entirely silent as to grain size distribution in its pigment layer as well as grain size distribution of the prior substrates to which the polyolefin coatings were applied in the past.

Thus, the position taken by the Examiner that the primary references disclose the grain size distributions of the present claimed invention is self defeating to the ability to modify those primary references by the teaching of the secondary reference SCHIAPPA et al. One skilled in the art would not perform such modification because of the expected adhesion problems. It is applicants who have in fact discovered the surprising fact that the adhesion problems that would have been expected do not exist. See specification, page 4.

In any event, the two independent claims 1 and 15 in the present application have also been amended herein to set forth that, unlike all of the previously discussed prior art, the pigment layer is image free. In contrast, all of the pigment layers of the above discussed prior art are in fact the image receiving layers and are expressly printed directly thereon in one manner or another. Thus, all of the elected claims should clearly define over that prior art.

Although the description of the present invention in the specification does not expressly state that the pigment layer is image free, it is clearly inherent from the original disclosure that it is image free for at least two reasons. One reason is that there would be absolutely no desire or need to have an image on the pigment layer because it would be obscured and rendered entirely useless by the ultimate application of the image receptive layer and the development of the photograph, ink jet or thermal transfer image thereon. Secondly, if there was an image on this underlying pigment layer, it could interfere with the later developed image on the image receiving layer which is on the polyolefin layer because such underlying image, if partially visible at all through the layers after development of the desired photographic, ink jet or thermal images on the very top layer, could interfere with the clarity or contrast of the desired final images.

The original disclosure further supports the fact that the pigment layer is image free.

For example, at page 4, second full paragraph, it is stated:

> It was surprising that a substantially better <u>adherence of the polyolefin layer to the pigment layer</u> of the raw paper was achieved than in EP 0 952 483 A1. (emphasis added)

Thus, the pigment layer must be image free if the synthetic resin adheres to it as stated.

Another example appears at page 6, last paragraph, where it is stated:

> The surface of the pigment layer according to the invention is coated with a synthetic resin, for example a polyolefin such a polyethylene, polypropylene, or polyethylene, or polybutene, as well as with copolymers of two or more olefin, by extrusion. (emphasis added)

Again the pigment layer must be image free if the "surface of the pigment layer" is to be coated with the resin as stated.

Still another example appears at page 9, the paragraph following example 19, where it is stated:

> The raw papers coated according to the Examples 1 to 19 were coated with a mixture of 72% by weight of a low-density polyethylene (LDPE, 0.923 g/cm^3). . . . (emphasis added)

The "papers coated" according to the Examples 1 to 19 were coated with LDPE and the Examples 1 to 19 say nothing about the existence of an image on the products which were prepared as described in those Examples. In the products of Examples 1-19 there is absolutely no mention of an image as part of the products of those Examples which are coated with the resin.

For the above reasons, it is respectfully submitted that all of the elected claims remaining in the present application, claims 1-6, 8, 10, 11, 15-18 and 20-25, are in condition for allowance. Accordingly, favorable reconsideration and allowance are requested.

Respectfully submitted,

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